

National Forest Policy in India: Critique of Targets and Implementation

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Abstract For any country, the forest policy is an important guideline to maintain forest resources and their interaction with other land uses. India devised its first National Forest Policy (NFP) back in 1894. There has been a paradigm shift from timber production to forest conservation followed by community-based agroforestry and social forestry bringing a change in perspective towards forest resources. This change has been socio-economic, cultural and ecological. Since the 1952 NFP, there has been an advocacy for 33% forest cover with a 60% forest cover in mountainous and hilly regions. This objective was reiterated in the NFP 1988 and also confirmed in the National Forestry Commission report in 2006. This paper reviews the probable reasons for these targets. This paper also analyzes forest cover trends at state level and assesses the likelihood of meeting the prescribed policy targets under present perspective of land use practices. Only three Indian states meet the prescribed policy, while three more have the potential to do so, if their state wasteland area is afforested. Among the rest, a few states may achieve the 33% goal provided land conversion to tree cover is not hindered, and adequate resources are available at state level. The Planning Commission (XI Five-year Plan, 2007–12) has emphasized inclusion of other natural ecosystems (including treeless areas and trees outside forests) to forest cover. The paper also examines the above prescribed targets in light of the Planning Commission recommendations. It is argued that that the NFP

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should be re-visited and revised to meet the targets, along with setting a more realistic and attainable target for Indian forest and tree cover.

Keywords Forest cover · Forest definition · Five-year plan · Joint management

Introduction

Forests constitute 21.0% of the geographic area of India (i.e. 69.1 M ha) (FSI 2009) and forestry represents the second major land use in the country after agriculture and it has been estimated that nearly 41% of the country's forest cover has been degraded to some degree (MoEF 2002). More than 14% of the population in India lives in the vicinity of forests (MoEF 2002), which provide both tangible (directly quantifiable products) and intangible benefits (such as values of biodiversity conservation, control of environmental pollution, and aesthetic and cultural values) (Kumar 2002). Forests form a dominant part in the physical, economic and spiritual lives of the population (Byron and Arnold 1999). In terms of biodiversity, India displays considerable richness because it is located in one of the 12 identified mega-biodiversity regions of the world, with about 47,000 species of flowering and non-flowering plants representing about 12% of the world's recorded flora, and 90,000 animal species identified so far representing 7.28% of the world's recorded fauna (MoEF 2007). Historically too, India's forest resources have been accorded due importance since 2500 BC, such that forests in India have been viewed as a source of limitless product (Marcot 1992).

Forests are important not only at the local level but also at the global level. Realization of the importance of forests at the global level has not only led to the emergence of organizations such as the International Union of Forestry Research Organization (IUFRO), United Nations Conference on Environment and Development (UNCED) and Intergovernmental Panel on Climate Change (IPCC), but also the signing of various multilateral environmental agreements, including the Convention on Biological Diversity (CBD), United Nations Framework Convention on Climate Change (UNFCCC) and Kyoto Protocol. Changes in forest cover have been made one of the 48 indicators of the Millennium Development Goals (MDGs) under Goal 7 (ensuring environmental sustainability) (Rawat et al. 2003).

The importance of forests, at both global levels and local levels, leads to the question what constitutes a forest? Nearly 130 different definitions of forests have been reported from more than 30 countries (Helms 1998; Lund 1999). The Oxford English Dictionary defines forest as ¹'An extensive tract of land covered with trees and undergrowth, sometimes intermingled with pasture. ²Historically, an area, typically owned by the sovereign ... and having its own laws' (OED 2003). The Encyclopedia Britannica considers a forest to be a 'complex ecological system, in which trees are the dominant life form' (Encyclopædia Britannica 2010).

According to the Forest Resource Assessment (FRA) 2005 (FAO 2006, p. 5), 'a forest is any land spanning more than 0.5 hectares with trees higher than 5 m and a canopy cover of more than 10%, or trees able to reach these threshold in situ. It does not include land that is predominantly under agriculture or urban use'. Wikipedia

provides a more ecological definition ‘A forest is an area with a high density of trees. These plant communities cover large areas of the globe and function as carbon dioxide sinks, animal habitats, hydrologic flow modulators, and soil conservers, constituting one of the most important aspects of our biosphere’ (Wikipedia 2010). The Manual of Forestry by Schlich (1912) defined a forest as: ‘An area which is for the most part set aside for the production of timber and other forest produce, or which is expected to exercise certain climatic effects or to protect the locality against injurious influences; such areas are frequently subject to special forest laws and legislations’.

The technical glossary of Forest Research Institute (1953) defined forests in general, ecological and legal terms (a) ‘General—An area set aside for the production of timber and other forest produce, or maintained under woody vegetation for certain indirect benefits which it provides e.g. climatic or protective;’ (b) ‘Ecologically—A plant community, predominantly of trees and other woody vegetation, usually with a closed canopy’ and (c) ‘Legally—An area of land proclaimed to be a forest under a forest law’. However, the Forest Survey of India (FSI) regards ‘Forest Cover’ as an area more than 1 ha in extent and having tree canopy density of 10% and above.

The Supreme Court of India, interpreting the provision of the *Forest (Conservation) Act, 1980* has stated that ‘the word ‘forest’ must be understood according to its dictionary meaning. This description covers all statutorily recognized forests, whether designated as reserved, protected or otherwise ... in the Government record irrespective of ownership...’ (Godavarman T.N. Vs UOI 1996).

Considering the importance of forests and the fact that in India it is the second major land use, a question arises what proportion of the total geographical area of the country should be under forests or under green cover? This paper attempts to find a valid and scientific explanation for the genesis of the national 33% target for forest cover in India. It reviews the probable reasons for these targets and also analyzes the forest cover trends to check the possibility of meeting the prescribed policy targets, under the present land-use perspective. It also examines the prescribed targets in the light of the Planning Commission recommendations.

Characteristics of Forest Policies

At a global level, International Forest Planning (IFP) aims at sustainable and participatory management of forest resources and other woody vegetation. It takes analysis, policy formulation and strategic planning, implementation, and monitoring and evaluation into account while considering the forest policy. The conceptual design of NFPs needs to be flexible and dynamic in order for NFPs to be applicable to vastly differing political, socio-economic and ecological country contexts. The concept on NFP explicitly pertains to all countries and to all forest types, including tropical, subtropical and temperate areas. It reflects a global consensus on how forests ought to be managed and developed, but it is neither legally binding in itself nor embedded in any legally binding instrument.

An NFP helps an individual country approach the objective of sustainable use, conservation and development of forests, by guiding and streamlining existing

activities or programs towards a prescribed goal. An NFP is not a tangible document in the sense of a master plan, but a participatory process with defined outputs. The NFP goes far beyond a planning document. It is an iterative, long-term process, composed of various elements, including the country policy and legal framework related to forests, the participation mechanisms, and the capacity-building initiatives. In all its phases the NFP provides for learning cycles, which allow the experiences to be shared, and for lessons to be learned in order to fine-tune the planning process. The active call for feedback from stakeholders makes NFPs dynamic, adaptive and negotiable. A NFP not only provides for forest policy development and planning but also for their implementation on the ground. Participatory planning is a key to the process, hence links between normative planning (policy formulation), sector planning (elaboration of a strategy) and operational planning (action programs) are fostered. These aim to promote participatory implementation where the results of agreed objectives, policies and strategies on sustainable forest management are translated into specific actions developed by the stakeholders.

An NFP should not be regarded as an additional, parallel exercise, opposed to or competing with existing approaches to sustainable development. Instead, existing approaches can be taken as an entry point into a NFP, and themselves be integrated into the NFP process. Each country will need to find its own entry point for an NFP, based on its own set of circumstances, existing processes, institutional arrangements and capacities. Entry points may be based on a problem such as a sudden crisis (e.g. in sector finances), imminent threats (e.g. effects of deforestation), long-pending problems (e.g. sector performance gaps), or on a potential (e.g. increased contribution to national economic development and poverty alleviation, wood and energy supply, or ecological stabilization).

Forest Policies in India

Before the advent of colonial rule in India, there was no unified formal forest policy, various princely states having different approaches towards the forestry resources available in their areas. With the advent of British in India, forest management started in the mid-eighteenth century and the first policy statement was announced in 1894. However, there was no mention of any percentage of the land area that should be under the forest cover in India, probably because no need was felt at that time.

NFP 1894, or Circular F 22 of 1894, was the first formal forest policy statement of India, and was based on the Voelcker Report in 1893 on Improvement of Indian Agriculture. The main stated objective of this policy was to manage the State Forests for public benefit. However, the policy also provided for regulation of rights and restriction of privileges of users in the forest area. This regulation and restriction was justified only when the advantage to be gained by the public was great, the cardinal principle being that the rights and privileges of individuals must be limited, otherwise than for their own benefit, only to the degree as was absolutely necessary to secure that advantage. The Forest Policy did not accord due recognition

to forestry, and placed it below the agricultural needs of the country, especially as far as land use was concerned. The policy provided for four functional classes of forests, viz. Forests for Preservation, Forests for Commercial Purposes, Minor Forests and Pasturelands. Although the 1894 policy laid stress on the satisfaction of the needs of the local people over-riding the considerations of revenue, beyond this realization of maximum revenue was the guiding factor. The general perception remains that the 1894 Forest Policy aimed at State monopoly over the forest resources with revenue earning through timber harvesting the prime motive, and with agriculture given precedence over forestry (Gadgil and Guha 1995).

NFP 1952—the National Forest Policy of India in 1952—laid stress for the first time on having at least 33% of the national land area under forest cover. The 1952 policy also identified vital national needs, which included a system of balanced and complementary land use, with control over denudation in mountainous regions, erosion of river banks, invasion of sea-sands on coastal tracts, and shifting of sand dunes in desert areas. There was also attention to ensuring a supply of fuelwood, fodder and small timber. This policy also classified forests into four groups, namely protection forests, national forests, village forests and tree lands. Regarding forestry and its relation with agriculture, the policy stated that ‘The notion widely entertained that forestry, as such, has no intrinsic right to land but may be permitted on sufferance on residual land not required for any other purpose’ (GoI (Government of India) 1952, Para 8). Regarding the proportion of forest area in the country, the policy stated that ‘The proportion of land to be kept permanently under forests naturally varies in different regions. Practical consideration suggests, however, that India, as a whole, should aim at maintaining one-third of its total land area under forests. As an insurance against denudation a much larger percentage of the land, about 60% should be kept under forests for their protective functions in the Himalayas...’ (GoI (Government of India) 1952, Para 19).

NFP 1988—the current National Forest Policy—reiterated that ‘The national goal should be to have a minimum of one-third of the total land area of the country under forest cover. In the hills and mountainous regions, the aim should be to maintain two-third of the area under such cover in order to prevent erosion and land degradation and to ensure the stability of fragile ecosystems’. The NFP 1988 also laid primary emphasis on the maintenance of environmental stability and restoration of ecological balance through preservation and conservation of forests. The other main objectives of the policy are the conservation of the country’s natural heritage and biological diversity, increasing the productivity of degraded forests, and meeting the local needs of the people and encouraging their participation in the protection and management of forests. The derivation of direct economic benefit is to be subordinated to these objectives (MoEF 2007).

The NFP 1988 reiterates increasing the forest cover to 33% of the geographical area of the country through large-scale afforestation and social forestry programs, both in recorded forest areas and degraded unproductive land outside forest areas, without prescribing any time frame in which to achieve this target. The policy also encourages ‘joint management’ of forests involving village and other rural population, together with farm forestry and agroforestry schemes on private land to increase forest and tree cover (FTC).

Genesis of ‘Passing Marks’

The rationale for arriving at the ‘passing marks’—i.e. ‘a minimum of one-third of the total land area of country’ and ‘two-third of the area in hills’—was discussed in the background paper of the National Forest Policy of India, 1952. About this time forest policy-makers had analyzed the existing forest cover in various countries and regions of the world, which was to act as an ‘instructive guide to the proportion of forests in India to be aimed at’. European countries had 41.4% of the total land area under forest cover at that time while North America had 33.3%, Central and South America 38.9%, Middle East and East Africa 3.4%, Africa excluding North Africa 22.1%, South and East Asia 23.0%, the Pacific 6.3% and the world average 27.6% (GoI (Government of India) 1952). The close parallel between a high proportion of forest area and the general prosperity of a region was also noted by the policy-makers that time. After analyzing the existing forest cover in the states for which reliable data on forests were available, the policy makers in 1952 ‘aimed at increasing the overall percentage of area under forest to a minimum of 33.3%’ of the total land area (GoI (Government of India) 1952).

Meeting the ‘*Passing marks*’: Present status

The first forest cover assessment in India (in 1982) was carried out by National Remote Sensing Agency (NRSA) using the Landsat MSS data. Thereafter, periodic assessment of the forest cover was taken by Forest Survey of India. Biennial monitoring of forest cover commenced in 1987 with the publication of State of Forest Report (SFR), and the last SFR published in 2009 has shown an increase in forest cover. This might be attributed to inclusion of trees outside forests (TOF) in the forest cover map, which was started by Forest Survey of India, to keep abreast with changing definitions of forests since 2001 (FSI 2005) and utilize improved techniques and technology. SFR 1987 was based on 80 m resolution, with visual interpretation and with a minimum mappable unit of 400 ha, while SFR 2005 is based on 23.5 m resolution, digital interpretation and a minimum mappable unit of 1 ha (FSI 2005). However, between the 2003 and 2005 assessments, there has been a 0.11% loss in the forest cover, attributed mainly to the 2004 tsunami in Andaman and Nicobar Islands, submergence due to construction of dams in Madhya Pradesh and Chhattisgarh and shifting cultivation and misinterpretation of bamboo flowering in the North East of India (FSI 2005).

As forests presently constitute 21.0% of the land area of India (FSI 2009), hence to bring ‘... a minimum of one-third of the total land area of country’ and ‘... two-third of the area in hills ...’ under forest cover, as envisaged in Forest Policies of independent India, an additional 33.6 M ha of land area under forests is required. Towards this end, a 20-year National Forestry Action Programme (NFAP), with a financial projection of about 26.5 billion US dollars, with provisions for capacity building and technology transfer for achieving the policy objectives, has been launched by Government of India (MoEF 2007). The National Forest Commission (NFC) has recommended that States and Union Territories with a forest cover more than the required figure should be provided with special incentives to maintain the area under forest cover (MoEF 2007).

If such conditions are not met there will be severe consequences for vegetation composition, biodiversity loss and climate change.

The importance of forests and preserving forest cover has also been recognized by the Finance Commission, which allocates funds to the respective State governments. The Twelfth Finance Commission, having recognized that forests are a part of the nation's wealth and the country as a whole has a responsibility in preserving them. It recommended a grant of 197 M US dollars spread over the period 2005–2010 for the maintenance of forests. This grant is additional to what the states have been spending through their forest departments. The amount has been distributed among the states based on their forest area, and has been used for the preservation and conservation of forest resources.

Earlier initiatives on increasing the green cover in India included launching of social forestry programs in 1980s, setting up of the National Afforestation and Eco-Development Board (NAEB) in 1992, and creation of the National Wasteland Development Board (NWDB) in 1986 with an aim to afforest wastelands outside forest areas through various schemes. Out of the total wasteland in India (17.45% of total land area), only 70% can be used for increasing the green cover (Mathur and Sachdeva 2003). This included basically scrub land, waterlogged and marshy land, saline and alkaline area, shifting cultivation areas, degraded forest land, degraded pastures, grazing land, degraded land under plantation crop, and steeply sloping areas. Other areas—including gullies, ravine land, sand islands, coastal land, mining areas, industrial wastelands, barren rocky areas, snowfields, and glaciers—which account for nearly 30% of the wasteland cannot be converted easily. Further, some of these wastelands should be preserved for ecological and climate stabilizations.

Temporal Forest Cover Assessment

When considering the feasibility of achieving the forest cover targets it is important to analyze the potential of the states and union territories which presently do not meet the targets. With this aim, and with the present land-use practices, a detailed analysis of temporal forest cover assessment and other land use and land cover were carried out for all the states and union territories. The forest cover estimate data from 1987 to date (2007 data from ISFR, 2009) were collected from the various SFRs. The data on forest cover were then arranged in the temporal domain for the classes dense and open (and very dense in case of 2005 and 2009). At first level all the States and Union Territories were classified were grouped according to whether they are meeting the prescribed forest cover figures. Temporal increases and decreases in the forest cover and changes between dense and open forest were analyzed. Only nine of the states showed a continuous decrease in forest cover, 13 had a slight increase and the remaining 13 had static forest cover area. Notably, the 13 states with increased forest cover are very small, and the increase in forest cover is due to inclusion of TOF in the estimate of forest cover. The land use and land cover statistics developed under National Resource Repository assessment (NRSA 2007) was used to evaluate the availability of wasteland and non-forested land which could be converted into forest cover. Finally, three classes were made: (1)

states which *meet* the prescribed forest cover targets (2) states which *can meet* the prescribed forest cover targets provided wasteland and non-forest land can be converted to forest cover and (3) states which *cannot meet* the prescribed forest cover targets even if wasteland and non-forest land could be converted to forest cover.

Table 1 provides details of forest cover status for the various states and union territories, i.e. whether they have at least ‘...a minimum of one-third of the total land area of country’ and ‘... two-third of the area in hills ...’ under forest cover. Out of 35 states and territories listed, only 13 can meet the prescribed pass-marks for forest cover. Six of these 13 are hilly or mountainous, two are partially hilly states and the remaining five are the plains. Out of 22 states and territories which do not meet the pass-marks, only three states (Jharkhand, Orissa and Rajasthan) have the potential to achieve a green cover of 33%, even with the assumption that all the wasteland in these three states can be brought under green cover. However, this could not be achieved before 2012, as mentioned in the tenth Five Year Plan as advised by the Planning Commission. Notably, 31% of the total wasteland of area is scrubs land and another 22% is degraded notified forestland (Mathur and Sachdeva 2003). These are often interpreted in the forest cover areas due to seasonal variations and spatial resolutions of satellite data.

The 124 hill districts in India have an aggregate area of 28.2 M ha or 39.8% of the total geographic area of these districts. Out of these 124 hill districts, 55 have over two-thirds of their area under forest cover, 37 have between one-third and two-third, and 32 have less than one-third. Eight hill districts have forest cover less than 10% of geographical area. All the districts of the states of Arunachal Pradesh, Himachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura and Uttarakhand are hill districts and the average percentage of forest cover in these nine states is 66.1%. The geographic area under the hill districts includes high altitude mountainous wastelands (barren and rocky, with steep slopes and snow and glacial areas) which are not suitable for tree planting. The area under this category accounts for 18.3 M ha; if this area is excluded from the total area of the above hill districts, the forest cover in the hill districts comes to 52.4%.

Achieving 33% Forest and Tree cover

In the fifth five-year plan (1974–79), the Planning Commission set a monitorable target of achieving 25% forest and tree cover by the end of 2007 and 33% cover by the end of 2012. The present forest and tree cover of the country is 21.0% (FSI 2009). It is estimated that to achieve the set target by 2012, a total of 33.6 M ha of additional land must to be brought under forest and tree cover. The current rate of tree planting in the country is about 1.16 M ha per year, so achieving the NFP goals would require substantial effort.

The eleventh five-year plan (2007–12) document has set a monitorable target of increasing the forest and tree cover by 5% of the total geographical area. This would require an additional cover of about 16 M ha. Out of this, 5 M ha could be brought under the tree cover within the recorded forest area, while the rest is to be supplemented through agroforestry, farm forestry and social forestry programs

Table 1 Forest cover in Indian states

State or union territory	Forest cover as per ISFR 2009 (FSI 2009)					Classification
	Very dense	Dense	Open	Total	Forest cover (%)	
Andhra Pradesh	820	24,757	19,525	45,102	16.40	×
Arunachal Pradesh ^a	20,858	31,556	14,939	67,353	80.43	+
Assam ^a	1,461	11,558	14,673	27,692	35.30	+
Bihar	231	3,248	3,325	6,804	7.23	×
Chhattisgarh	4,162	35,038	16,670	55,870	41.33	+
Chandigarh	1	10	6	17	14.91	×
Dadra & Nagar Haveli	0	114	97	211	42.97	+
Daman & Diu	0	1	5	6	5.04	×
Delhi	7	50	120	177	11.94	×
Goa	511	624	1,016	2,151	58.10	+
Gujarat	376	5,249	8,995	14,620	7.46	×
Haryana	27	463	1,104	1,594	3.61	×
Himachal Pradesh ^a	3,224	6,383	5,061	14,668	26.35	×
Jammu & Kashmir ^a	4,298	8,977	9,411	22,686	10.21	×
Jharkhand	2,590	9,899	10,405	22,894	28.72	×, ±
Karnataka ^b	1,777	20,181	14,232	36,190	18.87	×
Kerala ^b	1,443	9,410	6,471	17,324	44.58	+
Lakshadweep	0	16	10	26	82.75	+
Madhya Pradesh	6,647	35,007	36,046	77,700	25.21	×
Maharashtra ^b	8,739	20,834	21,007	50,650	16.46	×
Manipur ^a	701	5,474	11,105	17,280	77.40	+
Meghalaya ^a	410	9,501	7,410	17,321	77.23	+
Mizoram ^a	134	6,251	12,855	19,240	91.27	+
Nagaland ^a	1,274	4,897	7,293	13,464	81.21	+
Orissa	7,073	21,394	20,388	48,855	31.38	×, ±
Pondicherry	0	13	31	44	9.14	×
Punjab	0	733	931	1,664	3.30	×
Rajasthan	72	4,450	11,514	16,036	4.69	×, ±
Sikkim ^a	500	2,161	696	3,357	47.31	×
Tamil Nadu ^b	2,926	10,216	10,196	23,338	17.94	×
Tripura ^a	111	4,770	3,192	8,073	76.95	+
Uttar Pradesh	1,626	4,563	8,152	14,341	5.95	×
Uttarakhand ^a	4,762	14,165	5,568	24,495	45.80	×
West Bengal ^b	2,987	4,644	5,363	12,994	14.64	×
Andaman & Nicobar Islands	3,762	2,405	495	6,662	80.76	+

^a Hilly/mountainous states^b partially hilly states

+ States meeting the criteria of 33% forest cover, ± States which can meet the criteria provided entire wasteland is converted to green cover, × states not meeting the criteria of 33% forest cover

outside the recorded forest area. The NFP target of having 33% forest and tree cover will require additional coverage of about 10–11 M ha, mainly outside the recorded forest area (Planning Commission 2008).

The Eleventh Plan document has recognized that the target of 33% of forest and tree cover reflects the tree component without accounting for other vibrant non-tree natural biomes including grasslands. It therefore prescribes that ‘recognition of biodiversity characteristics and ecological services rendered by habitats like grasslands, natural desert ecosystems, alpine, and riparian habitats suggests that several biomes, even if devoid of tree component, can be recognized as ‘green cover’ and accounted so’. It further prescribes that the NFP ‘objective of 33% tree/forest cover should be revisited for its definition on ecological considerations. The green cover should include the existing natural ecosystems within which the tree cover constitutes a sub-set’. This basically implies that for accounting 33% forest and tree cover in the country (60% in the mountainous and hilly regions), other natural ecosystems should also be taken into account, even though they are devoid of trees, because these natural ecosystems also perform ecological functions specific to them in the overall environmental scenario of the country.

Given the suggested inclusion of habitats rendering ecological services in the forest and tree cover area target, forest and tree cover was again assessed for all the states and territories with inclusion of percentage cover of the four natural ecosystems, namely pastures and grasslands, natural desert ecosystems, permanent area under snow-cover and alpine zones, and major water bodies. The number of states and territories meeting the percentage of 33% of forest and tree cover, and more than 66% in the hills, was increased from 13 to 19, the additional states being Himachal Pradesh, Jammu and Kashmir, Jharkhand, Orissa, Sikkim and Uttarakhand.

Challenges to Achieve 33% Forest and Tree cover

As a developing nation, India faces a major challenge in increasing its forest cover towards world standards and meeting the national policy objectives. The growing population has fuelled an increased demand for land as well as food and to meet this demand, natural forests have been converted for agricultural use, human settlements, timber and fuelwood. Primary threats to forests in India include illicit felling, excess removal of non-timber forest products, fodder, fuelwood, and forest fires. Sustainable forest management (SFM) has now been included in the national level planning and it is expected that in future the reckless degradation and destruction of forest area will be controlled.

The Government of India has drafted a 20-year National Forestry Action Programme (NFAP) for achieving the policy target in 1999 (MoEF 1999). The program, with a financial projection of about 26,463 M US dollars, addresses the issue of financial resources as well as capacity building and technology transfer for achieving the policy objectives, including forest cover targets (MoEF 2007). The National Forest Commission (NFC), set up in 2003, recommended that states with a forest cover more than the NFP target should be provided with special incentives to maintain the area under forest cover (MoEF 2007). The twelfth Finance Commission has also recommended an additional grant of 197 million US\$ spread

over the period 2005–2010 to the State and UTs for maintenance of forests. However, whether these initiatives succeed and to what extent, are yet to be seen.

Earlier also some initiatives were taken up but with mixed results. For example during 1980, various social forestry programs were started with an objective of increasing the area under forest cover, but their overall impact was not encouraging. Setting up of the National Afforestation and Eco-Development Board (NAEB) in 1992 was another step towards achieving the goal. The National Wasteland Development Board (NWDB) was created in 1986 with an aim to afforest wasteland outside forest areas through various schemes (MoEF 2007).

The National Forest Policies (NFPs) are supposed to be revised to strengthen the management, administration and development of the forestry sector, mainly based on the reduction in the forestland area, which is primarily due to forest clearance for agriculture expansion, for livelihood improvement, collection of non-timber forest products, timber extraction, but all these reasons also establish the linkages between local people and the political factors. Within the NFP designs the strategies for forest cover improvement, mainly forest protection and conservation, natural regeneration, forest plantations including high-quality timber plantations with active participation of the private sector is also discussed.

Some state governments implement programs suggested by the NFP or other policy prescriptions, at times even without considering whether those programs are suitable for that particular state, or even when there is no proper justification for the implementation of such programs given the climatic, edaphic and vegetative conditions. The example of wattle (*Acacia pycnantha*) plantations in Palni and Nilgiri hills are a case in point. These plantations have existed for more than three decades. However, because of these plantations, the near forest fringes have lost their local climatic conditions and biodiversity, and this introduction of alien species and the absence of wildlife have lead to an area which is no longer suitable to carry pristine forests in the coming decades. Thus forest plantations need to be raised only in those areas which are suitable for a particular species, or in other degraded sites, which have lost their capacity for natural regeneration. It is essential that such suitable sites and regions are identified for raising forestry plantations in order to increase the forest and tree cover. Such programs should necessarily have a priori scientific assessment and precise knowledge on the reasons of having plantation in any given region. Therefore, governments need to address the past and current vegetation condition, land-use activity and socio-economic livelihood, before the consideration of the national forest monitoring and assessment under the implementation of NFP.

The target of 33% of forest cover should not be an absolute figure, but should be flexible depending on the situational and contextual aspects of the forest resources. A more meaningful parameter would be able to assess the quality of the forest state, its density, its regeneration potential, and trends in the resource quantities and values. Similarly, for forestry schemes meant for poverty alleviation and or improving livelihood of rural population, it is not the extent of forest area that matters to the village communities, but rather a sustainable yield of a variety of forest products with different values, including non-timber forest produce is what is desirable.

Conclusion

A valid and scientific reason was sought for the genesis of the national 33% target for forest cover in India. The figure has emerged from the background of the NFP of India, 1952, when the then forest policy-makers, after analyzing the existing forest cover in various countries and regions of the world at the time, arrived at this target. However, even if this target were achievable, it would be an extremely difficult task considering constraints on availability of land and other resources for this purpose.

The question arises whether it would be a better alternative to adopt a more realistic and therefore attainable target of say 25 or 30%, and to focus on improving quality of growing stock of the remaining forest. As the Planning Commission has indicated, increasing the FTC by another 5% would require plantations over 16% of land, out of which 5% of land is available inside the reserve forest area, and a further 11% would have to be found outside the forest area, as agroforestry or farm forestry plantations. Therefore, perhaps the NFP could prescribe raising the FTC by 5% over the existing figure taking the cover of the year 2005 as the baseline.

The environmental and ecological services obtained from a degraded and patchy 33% of FTC could be attainable from 25 or 30% of relatively good condition forests. This would require a rethink at the policy level. The figure would be decided after a great deal of consultations and brainstorming among all the stakeholders, to ensure it is realistic, attainable and meets the approval of most stakeholders and the general interest of the country.

The Planning Commission's suggestion to include all natural ecosystems while accounting for the 33% of FTC is worthwhile. This requires a reclassification of the area under FTC, and would assist in meeting the national FTC target of 33%. Under this revised definition, the number of states meeting the target rises from 13 to 19, with the addition of Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Sikkim, Orissa and Jharkhand.

The question arises whether natural ecosystems—including the permanently snow covered areas—meet the environmental and ecological services and function of forest ecosystems. After all, the ecological definition of forests is 'an area with a high density of trees. These plant communities cover large areas of the globe and function as carbon dioxide sinks, animal habitats, hydrologic flow modulators, and soil conservers, constituting one of the most important aspects of our biosphere'. Naturally then, either the definition of forests or this target of 33% of FTC may need to be revised.

The review of the NFP by Indian Institute of Forest Management (IIFM 2001) has suggested to resolve, protect and improve the environment and forests of the country by initiating key programs including forest protection and afforestation, JFM, forest fire control measures, treatment of drought prone areas, strengthening of infrastructure, wildlife conservation, pollution control measures and implementation of environment law. But much of these activities are not justified or well integrated within the forest policy cycle. A new or revised NFP proposal (Fig. 1) is required to combine the top-down and bottom-up approaches for NFP implementation for a 20–25 years strategy on the Concept of Forestry Development. The National Forestry Programme at every 10 years can oversee the development and

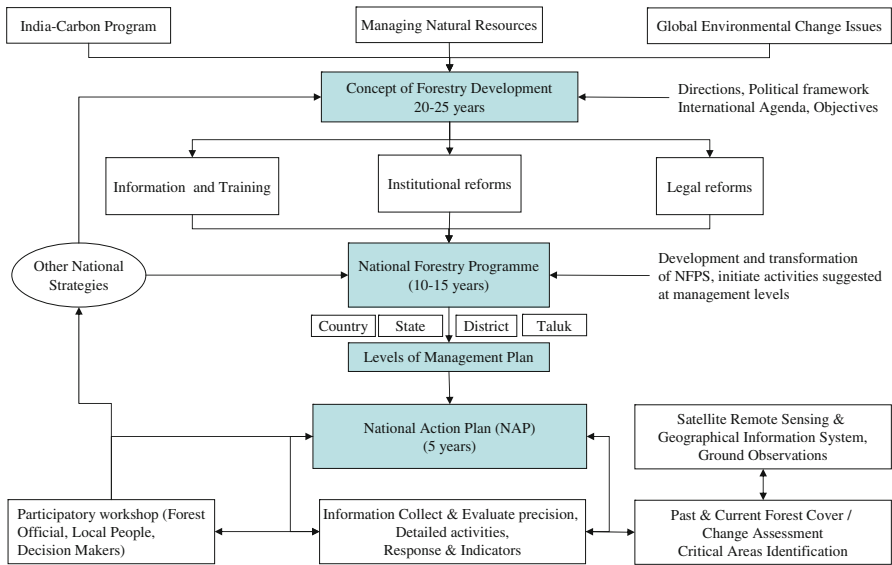


Fig. 1 Concept and design of science-based NFP, as a combination of top-down and bottom-up interdisciplinary approaches for forest policy cycle. *Source:* Aadapted from Kouplevastsckaya (2006)

transformation of the suggested activities at various management levels; this will ensure a systematic strategy relationship among various management levels and also coordinate mechanisms and procedures for conflict resolution. The National Action Plan (NAP) every 5 years should be integrated with other national strategy partners and collect information, and evaluate rapidly changing areas. Monitoring the critical forest area loss with the use of satellite remote sensing and GIS would assist in this regard. The revised scheme can continue with the creation of a geospatial database system for all natural resource areas, so that a reliable and goal-oriented NFP can be developed. This will require information and training along with some intuitional and legal reforms in forestry sector.

Post 1990, forestry has emerged as a crucial global issue with implications for climate change dialogues. The many other developments in ecology, environment, social and economic fields necessitate a debate as to whether these need to be reflected in the NFP. The NFP needs to include science-based inputs, as well as inputs from the political system and decision-makers, to inform other policies and programs, including the India Carbon program, and manage natural resources to address national and international environmental change issues. Thus the NFP needs to be linked with an educational and information system as well as legal reform. Further, it is suggested that NFP should not only adopt forest resource accounting and monitoring at an administrative level, but should also address the landscape level to provide an ecological perspective on maintaining the functioning of the wide range of ecosystems, which could provide value-added information using geospatial tools to address the global climate-change issues.

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